

# Hadronic Physics with Hadron Beams: Welcoming Remarks

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and  
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What We Hope To Accomplish (Ultimately)

# 1. Agenda

The purpose of the workshop is to bring together theorists, experimentalists and phenomenologists with an interest in hadronic physics experiments with hadronic beams.

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The workshop can be viewed as the essential first step needed in the planning of such experiments. While a few talks will be presented, it is expected that much of the time allowed for the workshop will be spent in open discussion aimed at articulating the physics questions that such experiments can answer, determining the feasibility of performing such experiments at the AGS, and identifying the fiscal and physical resources needed for carrying out such experiments.

- 9:00 - 9:15 W. Roberts: Welcome and Opening Remarks
- 9:15 - 9:50 W. Roberts, S. Capstick: The Physics of Interest
- 9:50 - 10:10 S. Capstick, M. Manley: The Potential Impact of Hadronic Beams Experiments
- 10:10 - 10:30 C. Bennhold: Identifying Missing and Exotic Baryon Resonances: Hadronic versus Electromagnetic Reactions
- 10:30 - 10:45 Break
- 10:45 - 11:30 Discussion of Physics and Analysis Issues (Discussion Leader: S. Capstick)
- 11:30 - 12:15 P. Pile: Beams at the AGS
- 12:15 - 12:30 Discussion

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- 12:30 - 1:30 Lunch
- 1:30 - 1:50 J. Comfort: Pentaquark Searches and Spectroscopy at the AGS
- 1:50 - 2:10 J. Comfort: Detector Questions
- 2:10 - 2:30 M. Sadler: Beam Lines and Running Time
- 2:30 - 3:15 Discussion: Beams, Detectors and Experimental Issues (Discussion Leader: J. Comfort)
- 3:15 - 3:30 Break
- 3:30 - 5:00 General Discussion: next steps, strategy, LRP, etc. (Discussion Leader: W. Roberts)
- 5:00 Adjourn

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## 2. RSVP

The current primary mission of the AGS is to supply accelerated heavy nuclei to the Relativistic Heavy Ion Collider (RHIC), a top priority of the U.S. nuclear physics community. Yet with modern control systems the AGS can fill the RHIC storage ring twice per day, and still accelerate protons for RSVP experiments for the remaining 20 hours per day. At modest incremental cost, roughly a 10% additional capital investment, the AGS can thus perform triple duty, pushing back the frontiers of physics on multiple fronts and consolidating a remarkable portfolio of scientific and educational opportunities in a single facility.

**RSVP:** Rare Symmetry Violating Processes

More info at <http://www.bnl.gov/RSVP>

Two experiments:



( $\mu - e$  conversion, via  $\mu^- N \rightarrow e^- N$ );



$K_L^0 \rightarrow \pi^0 \bar{\nu} \nu$ .

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Courtesy Brad Keister, NSF:

- R&D funding began in FY01;
- RSVP will be funded through an NSF MRE (Major Research Equipment) package totalling more than \$140M, not including funding for the AGS;
- \$8M per year, above and beyond the \$140M, to cover incremental cost of running AGS (implied commitment);
- \$30M MRE request for construction in FY05;
- Directive (unfunded) to spend \$6M in FY04 (not part of the MRE).

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### 3. What We Hope To Accomplish

- Assess the feasibility of running a suite of experiments at the AGS, either prior to or concurrent with the RSVP suite:
  - energy and beam line
  - detector
  - cost

- If AGS assessment is unfavorable, examine possibilities at other facilities: JHF, GSI, JLab, etc., with same questions about energy, cost, etc.

- Identify ‘modus operandi’.

Discuss the pros and cons of a focused or ‘extensive’ research program, and what’s more likely to succeed in receiving support from the agencies:

Baryons and pentaquarks;

Mesons (including exotics);

Hypernuclei;

Generalized Parton Distributions;

If focused, form a plan for getting support of large fraction of nuclear physics community.

If broader, identify steps that need to be taken to organize the larger effort

Role for Hadronic Physics Topical Group;

Importance of international collaborators, and possibly funding.

- Goal: high priority in next LRP?

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